II. Claims 13-24 Meet the Definiteness Requirement of 35 U.S.C. § 112

Claims 13-24 are rejected under § 112, second paragraph for their use of the term "perceptibly" and "perceptibly dissolves in the lyosol." Applicants respectfully traverse the rejection.

The meaning of the phrase "does not perceptibly dissolve in the lyosol," as recited in claim 13, is well recognized by those skilled in the art. It is well established that if one skilled in the art would be apprised of the meaning of a term used in the claims then the term is considered to be definite.

The word "perceptibly" is the adverb form of perceptible, which is defined as capable of being perceived. See 10th Ed. Merriam-Webster's Collegiate Dictionary. Perceptible is synonymous with appreciable, which is defined as distinctly discernible by the senses or definitely measurable. Thus, one skilled in the art in performing the process recited in claim 13, would use a medium which does not dissolve in the lyosol to an extent or degree distinctly discernible by the senses or definitely measurable. Such medium would be well recognized to satisfy the term "does not perceptibly dissolve in the lyosol."

Further, the word "perceptibly" is a well recognized word in the chemical arts and is widely used in US patents. A search at the US Patent and Office web site shows that 1405 US patents use the term "perceptibly" and that is just amongst those US patents that are text-searchable. In fact, fully 90 of those searchable US patents use "perceptibly" in their claims. Accordingly, the present claims fully meet the requirements of §112 in using the well recognized chemical term "perceptibly."

III. Claims 13-14 and 16-19 Are Not Anticipated by Bergna et al.

Claims 13-14 and 16-19 are rejected under § 102(b) over Bergna et al. (US 4,131,542) together with Grant and Hackh's Chemical Dictionary (page 258) and Chemical Engineer's Handbook (pp. 20-58 to 20-63). Applicants respectfully traverse the rejection.

Bergna et al. does not anticipate claims 13-14 and 16-19. Claim 13 recites a method for producing substantially globular lyogels in which the gel forming components are mixed to produce a lyosol, after which the lyosol, in order to form a lyogel, is introduced into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly

dissolve in the lyosol. Accordingly, the lyogel is formed in the moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol.

Bergna et al. expressly teaches avoidance of gelling. The tendency of its sol to gel is said to be marked, in its incipient stages, by an increase in the viscosity of the sol (Col. 4, lines 39-41), and that its sol is dried before any substantial increase in viscosity has occurred (Col. 4, lines 31-35). Nowhere does Bergna et al. suggest that spray drying is used to achieve formation of a gel. Bergna et al. takes "dried sol" from the spray-drying apparatus. To further support this fact, Bergna goes on to state that spray drying is used to achieve rapid drying of the sol. See Col. 4, lines 41-43. In addition, the Examiner acknowledges on page 9 of the Office Action that Bergna et al. teaches that spray drying is carried out before gelling.

In stark contrast, the present claims recite a method wherein lyogel forms when the lyosol is introduced into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol. Because Bergna et al. fails to disclose formation of a gel by introducing a lyosol into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol, claim 13 is not anticipated by Bergna et al.

Further, Bergna et al. does not teach ever forming a gel, but is instead directed to drying aquasol or organosol into porous micrograins referred to "PMG" in Bergna et al., that are then sintered. Bergna et al. repeatedly discusses prevention of gel formation by rapidly spray-drying the sol and/or adjusting the pH to stabilize the sol against gelling or aggregation. See, e.g., Col. 4, lines 36-42 and Col, 4, lines 16-22. Accordingly, Bergna et al. fails to disclose the subject matter of claim 13, and, therefore, Bergna et al. does not anticipate claim 13.

Further showing that Bergna et al. is not producing gels, Bergna et al. recites at Column 1, lines 45-46 that "the present process involves spray-drying an aqueous sol in a manner similar to that disclosed in U.S. Pat. 3,301,635." U.S. patent. 3,301,635 describes formation of amorphous silica bodies and not formation of gel. Amorphous colloidal silica powder is heated to a temperature of at least 1000 °C to form amorphous silica bodies. See Column 1, lines 14-18.

The Examiner asserts (on page 9 of the Office Action) that Bergna et al. produces a product

that is silica with trapped water in a hollow sphere, and the Examiner further asserts that this product meets the definition of the a gel. Applicants respectfully disagree.

Nowhere does Bergna disclose a silica product with trapped water in a hollow sphere. Figure 1 of Bergna indicates that voids are formed but fails to disclose that such voids are occupied by water or anything else. The Examiner refers Applicants to column 8, lines 8-11, where a process of freeze-drying is discussed. Bergna et al. states at column 7, lines 70-72 that freeze-drying, is another method for converting a silica sol to a dry powder with minimum coalescence of the ultimate amorphous silica particles. This simply fails to disclose forming a lyogel by introducing a lyosol into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol.

Grant and Hackh's Chemical Dictionary (page 258) and Chemical Engineer's Handbook (pp. 20-58 to 20-63) merely provide definitions for some of the terms in Bergna. However, it is self evident that these definitions cannot cure the deficiencies of Bergna et al discussed above.

Because they fail to disclose each and every element of claim 13, claim 13 is not anticipated by Bergna et al. with Grant and Hackh's Chemical and Chemical Engineer's Handbook. Each of claims 14 and 16-19 depend directly or indirectly from claim 13 and is patentable over Bergna et al. for at least the same reasons. Applicants request withdrawal of the rejection and allowance of claims 13-14 and 16-19.

IV. Claims 13-14 and 16-22 Are Not Obvious Over Bergna et al.

Claims 13-14 and 16-22 are rejected under § 103(a) over Bergna et al. taken together with Grant and Hackh's Chemical Dictionary and optionally in view of the Chemical Engineer's Handbook. Applicants respectfully traverse the rejection.

The discussion above in reference to claim 13 is incorporated here by reference. In brief, Bergna et al. teaches avoidance of gelling, whereas in the subject claims of the present application, a lyosol, in order to form a lyogel, is introduced into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol. Thus, Bergna et al. taken together with Grant and Hackh's Chemical Dictionary and optionally in

view of the Chemical Engineer's Handbook fails to teach or suggest the subject matter of claim 13.

Claims 14 and 16-22 each depend directly or indirectly from claim 13 and are patentable over Bergna et al. taken together with Grant and Hackh's Chemical Dictionary and optionally in view of the Chemical Engineer's Handbook for at least the same reasons. Accordingly, claims 13-14 and 16-22 are patentable over Bergna et al. taken together with Grant and Hackh's Chemical Dictionary and optionally in view of the Chemical Engineer's Handbook. Applicants believe the rejection to be improper and request withdrawal of the rejection and allowance of claims 13-14 and 16-22.

V. Claims 13-24 Are Not Obvious over Marisic in View of Fernholz et al. and Optionally in View of Mielke et al.

Claims 13-24 are rejected under § 103(a) over Marisic (US 2,384,946) in view of Fernholz et al. (US 3,939,199) and optionally in view of Mielke et al. (US 5,656,195). Applicants respectfully traverse the rejection.

Claims 13-24 are not obvious over Marisic in view of Fernholz et al. and/or Mielke et al., because the combination of the references fails to teach or suggest all the elements of the claimed subject matter. There is no teaching or suggestion in Marisic that a lyosol is introduced into a moving medium which does not perceptibly dissolve in the lyosol. Quite to the contrary, Marisic expressly teaches: "it is essential ... that the **[hydro]sol** be not mechanically disturbed during the time of setting." See page 2, right column, lines 1-5. Consistent with this contrary teaching, the fluid medium filling most of Marisic's tank 11 does not flow substantially against the direction of the force of gravity. See page 2, right col., lines 41-56. In stark contrast, claim 13 of the present invention recites mixing gel forming components to produce a lyosol, after which the lyosol, in order to form a lyogel, is introduced into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol. Thus, Marisic fails to teach or suggest the subject matter of claim 13.

Fernholz et al. fails to cure the deficiencies of Marisic. Fernholz et al. is directed to oxacylation of olefins in the gaseous phase. Fernholz et al. forms particles without pores by hydrolysis of silicium, zirconium and titanium tetrachloride in a hydrogen-air or oxyhydrogen flame or by melting micronized substances by blowing the particles through a hot flame. See column 1,

line 66 to column 2, line 9. There is no teaching or suggestion in Fernholz et al. to mix gel-forming components to produce a lyosol. Instead, Fernholz et al. teaches using silicic acid as a support for a catalyst. See claim 1 of Fernholz et al. Therefore, Fernholz et al. does not teach or suggest mixing the gel forming components to produce a lyosol, after which the lyosol, in order to form a lyogel, is introduced into a moving medium which flows substantially against the direction of the force of gravity and which does not perceptibly dissolve in the lyosol. Thus, Marisic in view of Fernholz et al. fails to teach or suggest the subject matter of claim 13.

In addition, there is no suggestion or motivation to combine Fernholz et al. with Marisic. In particular, because Marisic is directed to hydrogel pellets and because Fernholz et al. is directed to using particles without pores as a support for a catalyst, one skilled in the art would not combine Fernholz et al. and Marisic. That is, one skilled in the art would not look to Fernholz et al. to cure the deficiencies of Marisic. Accordingly, Marisic and Fernholz et al. are not properly combinable.

Mielke et al. fails to cure the deficiencies of Marisic in view of Fernholz et al. Mielke et al. teaches molding of particles and states that silica gel particles can be prepared from a waterglass solution by the stages of silica hydrogel, solvent exchange, and subsequent supercritical drying. See column 2, lines 30-36 of Mielke et al. There is no teaching or suggestion in Mielke et al. to introduce a lyosol into a moving medium which does not perceptibly dissolve in the lyosol.

In addition, there is no suggestion or motivation to combine Mielke et al. and Marisic. In particular, because Marisic is directed to hydrogel pellets and because Mielke et al. is directed to moldings requiring a binder, one skilled in the art would not combine Mielke et al. and Marisic. Accordingly, Mielke et al. and Marisic are not properly combinable.

Because Marisic in view of Fernholz et al. and/or Mielke et al. fails to teach or suggest all elements of claim 13, claim 13 is patentable over Marisic in view of Fernholz et al. and/or Mielke et al.

Each of claims 14-24 depend directly or indirectly from claim 13 and are patentable over Marisic in view of Fernholz et al. and/or Mielke et al. for at least the same reasons. Accordingly, the rejection is improper and should be withdrawn.

VI. Conclusion

In view of the foregoing remarks, Applicants request withdrawal of the rejections and allowance of all pending claims.

Respectfully submitted,
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